

List of sessions WBF2024

(In alphabetical order by session code, listing only the main convener)

AGECO_18.1

Paradigm shift in agro-ecology: from patch-scale conservation measures to designing biodiversity-friendly landscapes

Eva Knop, Agroscope / University of Zurich, Reckenholzstrasse 191, 8046 Zürich, eva.knop@ieu.uzh.ch

Biodiversity is declining worldwide, with intensification of agricultural practices and the associated loss of semi-natural habitats being a major driver of it. To halt the ongoing decline in farmland biodiversity, despite decades of conservation efforts, there are growing calls to rethink the strategy. While most conservation actions currently focus on patch-scale measures such as set-aside fields, there is a growing consensus that a landscape approach is needed, thereby creating so-called biodiversity-friendly landscapes and promoting biodiversity at the landscape scale. Yet, we currently do not have a clear understanding of what are the key drivers of biodiversity at the landscape scale, especially in an agricultural setting. There is already a good knowledge base on the effectiveness of a range of different local measures to promote patch-scale biodiversity. However, the next important step is to understand the complex interactions between the different drivers and measures as a whole. The goal of this session is therefore to bring together the latest findings on factors influencing biodiversity at different scales and to provide examples of implementation strategies that can make agricultural policies more biodiversity friendly. We will approach this goal by presenting the latest findings from agro-ecologists and contributions from other disciplines that are pioneering new ways of conserving biodiversity on farmland, by considering the interplay of the many influencing factors present in an agricultural landscape, and by thinking across scales in order to develop strategies that promote biodiversity on a larger scale. Finally, a joint discussion among the speakers will bridge the insights gained and discuss how we manage to translate science into agricultural practice that truly safeguards biodiversity in agro-ecosystems.

ARC_23.1

Understanding the role and destiny of Arctic Biodiversity in a changing world

Ramona Heim, Department of Evolutionary Biology and Environmental Studies, University of Zurich, Winterthurerstrasse 190, 8057 Zurich, ramona.heim@uzh.ch

Global change is causing significant changes in Arctic ecosystems, posing a serious threat to Arctic biodiversity. As the pace of change is fast, it is essential to increase our knowledge regarding the role and destiny of Arctic biodiversity as an ecosystem component that experiences climate change and land use effects, but also as a factor influencing ecosystem health and stability.

This session aims therefore to bring together the latest study results, visions, and perspectives on the topic of Arctic biodiversity. Especially encouraged are contributions that address the effects of global change on Arctic biodiversity or showcase the importance of Arctic biodiversity for maintaining the stability and functioning of Arctic ecosystems and for supporting indigenous and local communities.

ARTSCI_24.1

Reflections, Intersections & Connections – Showcases of art-based expressions of nature-human relationships towards sustainable futures

Lynne Shannon, University of Cape Town, South Africa, lynne.shannon@uct.ac.za
Cornelia Krug, University of Zurich, Switzerland, cornelia.krug@uzh.ch

Transformative action across multiple dimensions of human society is needed to achieve sustainable futures on Earth. This will require shifts in mindsets and opening channels to include different perspectives and ways of knowing and being. Progress towards sustainable human-nature futures requires careful attention to be paid to relationships and interactions between humans and nature. These relationships can be captured/reflected, and positive actions inspired, through artistic expressions including art, dance, theatre, music and poetry. With this session, we would like to showcase projects and collaborations between arts, science and society that evoke change across a variety of sectors/dimensions of society by appealing to human connections with nature. We would like to hear about experiences and relationships created to encourage discussion around how these positive and influential artistic expressions might feed into a more structured and unified mechanism to achieve human-nature sustainability.

BCC_11.1

Effects of biodiversity on climate: micro and macro scale

Simon Landauer, University of Zurich, Winterthurerstrasse 190, 8057 Zurich, simon.landauer@uzh.ch

Climate and microclimate, in particular temperature, are of central relevance for sustaining ecosystem functioning in the Anthropocene. Yet, it remains unclear how biological diversity influences current climate and will mediate projected changes. This session aims to promote an understanding of the effects of biodiversity-productivity relationships on the local, regional, and global climate. Specifically, we are interested in thermal effects suggested to be driven by biological diversity at various scales - both biological, from local plot level to the landscape level, and climatic, from micro- to macroscale. We invite a diverse array of speakers focused on ecology, environmental and climate science, as well as policy. Contributions from experimental, observational, and modeling studies are equally welcome. Examples of topics fitting the session range from effects of local species diversity on microclimate to effects of landscape configuration, that is ecosystem diversity, on land surface heat fluxes. Furthermore, researchers investigating urban heat island effect mitigation through biological diversity and similar should feel addressed by this session. In general, we highly encourage the submission of applied studies on biodiversity-climate effects implementation to showcase best practices and promote future policy building. A sound understanding of relationships between biological diversity and climate will foster a discussion on the relevance of implementing nature-based solutions for mitigating ever-rising temperatures and climatic extremes. By synthesizing results from various scales and scientific fields, we hope to lay a foundation and spark ideas for political action at local, regional, and global administrative levels - from Science to Action.

BCC_11.2

Knowledge gaps and research avenues to leverage Nature-based Solutions (NbS) as a tool to mitigate and adapt to climate change

Rita Sousa-Silva, Institute of Environmental Sciences (CML), Leiden University, The Netherlands, CML, Leiden University, P.O. Box 9518, 2300 RA Leiden, The Netherlands, silva.as.rita@gmail.com

Climate change has and is projected to continue to impact ecosystems across all biomes. Nature-based Solutions (NbS) can be used for both climate change adaptation and mitigation. However, several knowledge gaps hamper the design and successful implementation of NbS on the ground. Under the umbrella of the European Biodiversity Partnership (Biodiversa+), the BiodivClim Knowledge Hub is joining experts from 21 pan-European research projects focusing on links between biodiversity and climate change. As part of its activities, the Knowledge Hub has identified the most pressing knowledge gaps on biodiversity and climate change across terrestrial, freshwater and marine ecosystems with the overall aim to better support decision-making, policy design and implementation of NbS. Gaps include, amongst others, uncertainty about the impacts of climate change on biodiversity and its relation to ecosystem functioning and resilience, societal and governance issues, and issues related to the up-scaling of NbS. Research avenues to overcome these and other knowledge gaps have also been proposed to guide future research. During this session, BiodivClim Knowledge Hub will set the scene for future research & innovation on the interlinkages between biodiversity and climate change within the broader context of other global challenges and existing science-policy platforms such as IPBES and IPCC. A series of talks will be given by experts from the Knowledge Hub and related EU NbS initiatives on identified knowledge gaps and proposed avenues, and from authors of IPCC and IPBES assessments, sharing their perspectives on the role of NbS to tackle the twin crises of biodiversity loss and climate change.

Confirmed speakers

- Hans-Otto Pörtner – keynote speaker, Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany, Department of Biology and Chemistry, University of Bremen, Bremen, Germany
- Filipa Grilo, BiodivClim Knowledge Hub, Centre for Ecology, Evolution and Environmental Changes & CHANGE-Global Change and Sustainability Institute, Universidade de Lisboa, Portugal

BCC_11.3

Satellite observations for a deeper understanding of biodiversity-climate feedbacks: progress and challenges

Sophie Hebden, Future Earth/ESA, Sophie.hebden@futureearth.org

As vast amounts of satellite data with high spectral, spatial and temporal resolution are becoming available, there has been a growth in efforts to produce information on biodiversity and ecosystem change. The biodiversity community has agreed on a set of Essential Biodiversity Variables to define the observational records needed to underpin research and monitoring activities at a global-scale. To better understand the dynamic relationships between climate stressors and biodiversity, research effort is required to develop theory and workflows to relate observational data to the different facets of a system and the feedbacks at work. This session will explore the diverse uses of satellite-derived information in the context of global to national-scale studies to examine climate-biodiversity feedbacks and impacts. Participants are invited to highlight proof-of-concept information and tools in the context of integrated R&D that can inform national to global-scale policy for climate and biodiversity commitments, and to point to the major research challenges that space agencies and research funders should address.

BEF_1.1

Advancing our understanding of freshwater ecosystems in the face of anthropogenic change: going beyond biodiversity

Rosetta Blackman, University of Zürich, Department of Evolutionary Biology and Environmental Studies, University of Zurich, Winterthurerstr. 190, CH-8057 Zürich, Switzerland, rosieblackman@gmail.com

Globally, freshwater ecosystems are among the most threatened with respect to loss of biodiversity. However, often our focus falls on species richness and fails to address the decline in ecosystem processes and function, which can ultimately cause ecosystem collapse. The rapid development of molecular and computational tools has led to an unprecedented opportunity to characterize population structure, communities, food webs and associations with ecosystem processes and functions. In this session we will focus on advancement in our understanding of the multidimensional facets of freshwater diversity (e.g., also considering genetic and functional diversity), its associations with ecosystem functions and ultimately the ecosystem integrity this provides. We invite talks from molecular tools (such as environmental DNA, metabarcoding and omics), computational approaches and established methods. We particularly invite talks with real-world application that aid conservation and protection of freshwater ecosystems and specifically address how we can resolve the challenge of anthropogenic stress, including cross-disciplinary thinking, global initiatives or citizen science approaches.

We will follow the “ABCD conference framework” (All Continents, Gender Balance, Low Carbon footprint and Diverse backgrounds) for this session which aims at bringing speakers from across the world together. We also aim to hold an extended discussion session at a suitable time for all speakers to attend. This will provide time for attendees to ask questions and to develop a road map of our ideas for tackling the freshwater biodiversity crisis.

Merged Sessions: BEF_1.2 & BEF_1.3

Biodiversity interactions with earth system processes &

Maria J. Santos, University of Zurich, Department of Geography, Winterthurerstrasse 190, CH-8057 Zürich, maria.j.santos@geo.uzh.ch

Biodiversity loss is threatening the persistence of earth system processes and biogeochemical cycles that maintain the function of our planet and the livelihoods of people that depend on them. Plants, an important component of terrestrial and aquatic biodiversity, have a fundamental role in mediating such biogeochemical processes yet are subjected to high rates of pressure from deforestation, pollution, and direct overexploitation. In this session we invite contributions that report investigation of plant mediated biogeochemical processes, e.g., flood and drought responses, water use efficiency, nutrient cycling, and carbon storage. We particularly welcome contributions that studied how plant biodiversity both on land and in the sea mediates and potentially enhances these processes. We are open to oral presentations that cover a range of scales from local to global, from plant genetic diversity to community diversity using many different methods, from empirical observations with remote sensing to experimental examinations. We hope to assemble a set of diverse speakers presenting interdisciplinary and integrative research to offer novel perspectives on plant diversity's vital role for earth system processes.

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Functional diversity in space and time: measurements, models and experiments to advance trait-based ecology

Fabian D. Schneider, Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, M/S 233-300, Pasadena, CA, 91109, USA, fabian.schneider@jpl.nasa.gov

Biodiversity is declining rapidly under stark pressures from anthropogenic and climate change, urging the need for biodiversity observations that can guide biodiversity policy and action related to biological conservation and restoration, as well as addressing critical science questions related to ecosystem resilience, adaptation, turnover, mortality and functioning. To that respect, functional diversity is an important dimension of biodiversity that can be measured from individuals to landscapes, including intra- and interspecific diversity, with strong links to ecosystem functioning. We encourage contributions that utilize a variety of measurement, modeling or experimental techniques to understand how and why functional traits and diversity are changing in space (from local to global scale) and/or time (from diurnal to decadal scale). Measurement techniques can range from in-situ measurements to terrestrial, airborne or spaceborne remote sensing, or a combination thereof. We welcome contributions from various ecosystems and taxa, including, for example, plants and animals in forests, grasslands or marine ecosystems. This session offers the opportunity for diverse, interdisciplinary and integrative research to be presented by people from various backgrounds, research fields, and institutions.

Merged Sessions: BEF_1.4 & BEF_1.8

Green and brown food webs &

Rebecca Oester, Institute of Microbiology, University of Applied Sciences and Arts of Southern Switzerland & Department of Evolutionary Biology and Environmental Studies, University of Zurich & Eawag: Swiss Federal Institute of Aquatic Science and Technology, Department of Aquatic Ecology, Switzerland, Rebecca.Oester@supsi.ch

The functioning of ecosystems, and the services they provide to human society, depend on all facets of biodiversity including ecological interaction networks and the dynamics of food webs. From a functional perspective, food webs and communities differ between those based on primary production (green) and detrital matter (brown). Since herbivores typically use only a minor part of primary production, most of the carbon and nutrients assimilated by primary producers enters the brown pathway. Detritus acts as a reservoir for carbon and nutrients and contributes to stability of ecosystem functions and to high consumer biodiversity. Processes related to carbon and nutrient cycling are connected to global cycles of these elements and are thus relevant for instance for carbon sequestration. While there are still gaps in our understanding of individual processes within each pathway, a much greater knowledge gap remains in the ecosystem-level causes and consequences of stocks, fluxes and process rates. In particular, linking the two above pathways of production and decomposition across space and time remains a challenge. We also lack a consolidated picture of food web characteristics and biodiversity facets that are important for maintaining the functional stability of interlinked food webs. Since food web pathways are constantly interlinked through consumption and nutrient cycling, considering them in concert might improve predictions of ecosystem responses to natural and anthropogenic perturbations as global change is expected to affect the functioning of both pathways. We invite contributions elucidating the role of different biodiversity facets for ecosystem functioning, dynamics of ecological interaction networks, in green and brown food webs and in particular those that explore the links between these two pathways.

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Understanding biodiversity and ecosystem functioning across ecosystem boundaries

Tianna Peller, University of Zurich/Eawag, tianna.peller@uzh.ch

Ecosystems are commonly linked through the spatial flow of living organisms and non-living materials. For instance, leaves flow from forests into streams, nutrients flow from watersheds into lakes, and migratory birds link ecosystems across continents. Linkages across ecosystem boundaries can enable dependencies between ecosystems that shape biodiversity and ecosystem functioning across scales. Likewise, ecosystem linkages can enable perturbations in one ecosystem to cascade across space to influence biodiversity and functioning in nearby and/or distant ecosystems. For instance, land use change, direct exploitation, and other drivers of biodiversity change in one ecosystem can alter spatial flows across ecosystem boundaries to cause adverse effects on spatially adjacent and/or distant ecosystems. To conserve biodiversity and ecosystem functioning we, therefore, need an adequate understanding of the ecosystem linkages present in nature and the mechanisms by which they influence biodiversity and ecosystem functioning. Moreover, since ecosystem linkages can span countries and management boundaries, transboundary conservation strategies are needed. In this



session, we bring together experts spanning theoretical, empirical, and applied disciplines to outline our understanding of the ecological impacts and significance of ecosystem linkages and explore a holistic vision for conserving ecosystem linkages and managing spatially cascading perturbations.

BEF_1.5

Insights from the past for a better future

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Species are going extinct at an accelerated rate. Despite some success stories, current conservation efforts have not been sufficient to halt extinctions, with more species threatened every year. However, these extinctions do not occur randomly in the tree of life, with some species being more vulnerable than others. What determines this extinction selectivity can provide key clues to target conservation actions. Given that 99% of species that have ever lived are already extinct, the fossil record can offer unique insights to better understand extinction mechanisms. For example, the study of past extinctions can provide clues on the intrinsic traits of species that make some species more prone to extinction than others, and on the long-term responses of species to environmental perturbations. This session focuses on the use of the fossil record to better understand extinction mechanisms and its potential applicability to inform conservation today. We welcome contributions from early career researchers and hope to assemble a diverse group of presenters. We encourage both near-time and deep-time perspectives on ecological and evolutionary processes during periods of environmental change (natural and anthropogenic) from disciplines such as paleoecology, palaeontology, and historical ecology.

BEF_1.6

Plant-consumer interactions in a changing world

Anne Kempel; WSL Institute of Snow and Avalanche Research SLF; Flüelastrasse 11, 7260 Davos; anne.kempel@slf.ch

A major scientific challenge is to predict how communities and ecosystems will respond to global environmental change. Global change can directly affect plant communities and their functioning; however, it can also alter species interactions. Warming and nitrogen enrichment for example might alter rates of herbivory or pathogen attack. Similarly, the current decline in insect diversity and biomass might have cascading effects on plant communities. Understanding how interactions between plants and their consumers are affected is critical, as changes in rates of herbivory or pathogen attack can have far-reaching consequences for biodiversity and ecosystem functioning, and altered plant-consumer interactions may profoundly affect, and even reverse, ecosystem responses to global change. However, research on this topic remains scattered and a synthesis of how global change alters interactions between plant and consumer communities is needed. In this session we bring together researchers addressing global change effects on plant-consumer interactions using a variety of approaches. Moreover, we elucidate the potential consequences of insect decline and pathogen spread on ecosystem functioning. We discuss effects of different global change drivers (e.g., climate change, nitrogen enrichment) and changes in different consumer groups, including often neglected ones such as foliar pathogens. We also include studies experimentally manipulating global change factors and/or consumer abundance, and those using local and global environmental gradients to learn more about the context-dependency of plant-consumer interactions. The aim of this session is to get an overview of cutting-edge research advances and remaining gaps in understanding how global change alters plant-consumer interactions and how this feeds back to ecosystem functioning.

BEF_1.7

River biodiversity at risk due to global drying: management challenges and perspectives

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Freshwaters are among the most biodiverse and threatened ecosystems on Earth. They provide habitat for many endangered species, support crucial biogeochemical cycles and provide key ecosystem services to people. In the Anthropocene Era, freshwaters are shrinking due to global change: rivers, wetlands and lakes are drying, groundwaters are being depleted and glaciers are disappearing. On the other hand, many freshwater ecosystems naturally experience alternating wet and dry phases. For example, drying rivers represent the dominant river type on Earth, with 51–60% of the mapped global river network prone to flow intermittence. This calls for a paradigm shift in aquatic science and management and to bridge the gap between terrestrial and aquatic ecology. After being overlooked for decades, the ecological effects of drying on biodiversity, ecological functions and services are now increasingly studied. This has led to uncovering of fundamental underlying mechanisms, but also the discovery of operational implications for biodiversity monitoring, conservation and restoration. This interdisciplinary session will investigate how natural and anthropogenic freshwater drying alters aquatic and terrestrial biodiversity, ecological functions and ecosystem services. It will particularly welcome studies making connections across available knowledge sources, projects and data portals, identifying opportunities, synergies and trade-offs that can inform policies, and guide freshwater management and conservation practices to halt and reverse biodiversity loss in freshwater ecosystems.

CONSU_4.1

Nature conservation to mitigate biodiversity loss and climate crises

Stefanie Gubler, Swiss Academy of Sciences (SCNAT), stefanie.gubler@scnat.ch

The 2022 UN Conference on Biodiversity (COP 15) pledges the conservation of 30% of terrestrial and marine habitats by 2030 in order to protect global biodiversity and ecosystem functioning. Similarly, the European Commission's biodiversity strategy suggests the establishment of a larger EU-wide network of protected areas. Besides protecting global biodiversity and slowing down biodiversity loss, these targets aim at mitigating climate change by preserving or enhancing carbon stocks in forests, peat- and wetlands, among others. While there is emerging evidence that protecting intact ecosystems should be prioritized, carbon markets and agricultural policies, for instance, are likely fostering shorter-term land-use and restoration measures rather than protection.

Several questions arise in view of these biodiversity targets that will be addressed in this session:

- a) What kind of protection is needed to effectively mitigate biodiversity loss and climate change?
- b) How do size, specific location and region as well as connectivity affect the success of conservation?
- c) What are the benefits and shortcomings of long-term conservation as implemented in protected areas and habitats, vs. short-term measures such as management contracts or restoration in terms of biodiversity loss and climate change mitigation?

In this session, we bring together researchers and experts elucidating the effects of protected areas and various conservation measures, and discuss factors that enhance or hinder the establishment of protected areas to ensure benefits for both biodiversity and climate.

CUL_8.1

Art-based expressions of nature-human relationships towards sustainable futures

Sebastian Villasante, University of Santiago de Compostela, 15782. A Coruña, Spain,
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Transformative action across multiple dimensions of human society is needed to achieve sustainable futures on Earth. This will require shifts in mindsets and opening channels to include different perspectives and ways of knowing and being. Progress towards sustainable human-nature futures requires careful attention to be paid to relationships and interactions between humans and nature. These relationships can be captured/reflected, and positive actions inspired, through artistic expressions including art, dance, theatre, music and poetry. We invite contributions from those using one of the aforementioned artistic expressions to evoke change across a variety of sectors/dimensions of society by appealing to human connections with nature, and hope to encourage discussion around how these positive and influential artistic expressions might feed into a more structured and unified mechanism to achieve human-nature sustainability.

Confirmed speaker

Elisa Morgera, University of Strathclyde, Scotland

CUL_8.3

Models and scenarios for biodiversity & NCP at regional to global scales

Christopher Wong, IIASA, Schlossplatz 1, 2361 Laxenburg (Austria), wong@iiasa.ac.at

Our understanding of what just pathways towards sustainability goals might look like from global to regional scales, and which interventions may materialize them, remain limited. Models and scenarios are increasingly used in research and policy support contexts for biodiversity and nature contributions to people (NCP), to investigate a burgeoning set of research and policy questions across a wide range of topics, scales, geographies and realms. New biodiversity & NCP-relevant scenarios are emerging, including adaptations of the SSP/RCP scenario framework and scenarios generated through the new Nature Futures Framework. An increasing number of modeling tools are developed and applied to quantitatively assess these scenarios. This session aims to feature new and on-going scenario and model work for biodiversity & NCP in various contexts from regional to global scales.

ESNCP_5.1

Combining social, economic and ecological viewpoints in nature's contributions to people (NCP) assessments

Roger Keller, Dept. of Geography | Space, Nature and Society, Affiliated Member of the University Research Priority Programme on Global Change & Biodiversity, University of Zürich Winterthurerstr. 190 | CH-8057 Zürich, roger.keller@geo.uzh.ch

In this session, we aim at discussing how social, economic and ecological viewpoints can be combined in nature's contributions to people (NCP) assessments, and which are the challenges when trying to combine these three viewpoints.

The session organizers are involved in the interdisciplinary research project ValPar.CH (www.valpar.ch), mandated by the Swiss Federal Office for the Environment (FOEN), that seeks at analysing how a functioning Ecological Infrastructure (EI) needs to be designed and maintained to provide the desired ecological, social and economic services in the future. Within ValPar.CH, different methods are used and combined to assess NCP. The research team applies natural, economic and social science methods and considers the socio-economic as well as biophysical aspects of NCP.

This session invites in particular scientists experienced in inter- (and trans-) disciplinary research, as well as specialist of indicator science to submit their proposals. We are especially interested in the following topic: Experiences on combining multiple viewpoints (e.g., social, economic, ecological) in NCP assessments.

Confirmed speakers

- Emmanuel Reynard, University of Lausanne
- Roger Keller, University of Zurich

Merged Session: ESNCP_5.3 & FIN_12.2

How bridging ecology and economy through native pollination can regenerate our approach on environment resources and its transformation

Lucy Xu, Global Portal Institute, lucyXu@globalportal.in ; The Port Global, LLC

Global food supply shortage due to pollinator decline leads to a reported mortality of more than half a million people per year. IPCC's 2023 report urges us to perceive this environmental and climate crisis not as a constraint but an opportunity.

An exchange network now exists in institutions and schools in remote communities on both sides of the Amazon Basin using native stingless pollinator shelters. This unique and vital Nest-work is now being scaled across primary rainforest regions to:

- Design infrastructures for the education of children and training local environmental leaders;
- Bridge private and public interests in long-term conservation solutions (i.e., the associated 2022 Inaugural Symposium on the Native Stingless Bee resulted in the first pollinator conservation law discussed in Peru's history);
- Provide alternative income opportunities through honey produced by the native stingless bee, considered the best in the world since the time of the Ancient Mayans and a global market valued at US\$557 billion;
- Open global trade and create new native footprints in the pharmaceutical, nutritional, cosmetic, and climate sectors (e.g., the antibiotic, antibacterial, and antioxidant properties of stingless bee honey are currently being investigated by the world's largest brands).

Actors are now collecting biodiversity data for a collaborative "Living Atlas" mapping the interaction between people and pollinators, scientists and communities, and public and private institutions, to identify, implement, and increase the information relating to our interactions with pollinators. To date, the Nest-Work spans 6 countries, 12 indigenous communities, 319,000 students, and 1.1 million pollinators.

This session, open to all, will explore the Nest-work in detail and highlight how it is being scaled across primary rainforest regions, in this new Silk Corridor model from the East to West, thereby offering all the chance to participate in the shift in the ecology and economy paradigm.

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Measuring, Pricing and Restoring Biodiversity Loss: Latest Applications and Call to Action

Edoardo Chiarotti, Enterprise for Society (EPFL, UNIL, IMD), Rte de Blévalaire 16, 1024 Ecublens, Switzerland, edoardo.chiarotti@unil.ch

The session will present and discuss the latest scientific applications for measuring, pricing and restoring the negative impact of human activity on biodiversity. The focus will be on systems that can be applied at large scale to create polluter-pays funding mechanisms for nature restoration. The session will welcome interdisciplinary contributions, from ecology, to data science and economics. The scope of the session will be to launch a call to action to coordinate efforts between academia and practitioners and support policy-making initiatives on nature restoration.

ESNCP_5.4

How to balance biodiversity and forest management?

Frank Krumm, WSL, Frank.krumm@wsl.ch

Forests are vital for biodiversity conservation, freshwater supply, climate regulation, and the well-being of local communities. Covering over 30% of the Earth's land surface, they house approximately 80% of the world's biodiversity. Moreover, forest watersheds contribute to more than 75% of global freshwater resources, and one-third of the world's population depends on forests for firewood for cooking and heating.

However, the alarming rate of forest loss, amounting to approximately 10 million hectares annually, and the degradation of existing forests necessitate immediate action. Additionally, climate change, disturbances and land-use change have strong impacts on forest and landscape dynamics. As habitats change, species will likely migrate and/or disappear. Biodiversity is the foundation for a sustainable provision of ecosystem services worldwide, and therefore of highest significance for human being. Therefore, the management of forests must be adapted and optimized to halt further biodiversity loss.

Nevertheless, the growing demand for forest products and the increasing pressure from other land uses continue to challenge forest conservation efforts. Furthermore, forest management has become increasingly complex due to rapidly changing environmental conditions, and the traditional approach of forest management, solely focused on biomass production, is considered outdated and limited. Forest managers must adapt their strategies to consider a broader landscape perspective, local conditions, and historical context.

Our session focusses on forest management with emphasis on biodiversity conservation. We seek contributions that highlight good theoretical concepts and successful management practices implemented in specific regions. The approaches presented should aim to strike a balance between conserving and enhancing biodiversity while providing crucial ecosystem services. Such approaches prioritize management actions based on societal needs and local conditions while seeking to enhance specific ecosystem services. Presenters will share their perspectives on integrating biodiversity into forest management, inspiring others to learn from existing approaches and help improving biodiversity at different scales.

ESNCP_5.5

Nature-Based Solutions for Reinforced Disaster Risk Management

Felix Kwabena Donkor, University of Education-Winneba, felixdonkor2002@yahoo.co.uk

Climate projections indicate an increase in the intensity and frequency of extreme events globally. Nature provides several solutions for limiting the impacts from disasters and climate change. The so-called 'Nature-based solutions' (NbS) are an important piece in the puzzle to building the resilience of households and communities to an ever-increasing number of disaster events around the world. NBS are robust and adaptive interventions to conserve natural or modified systems. NBS can reinforce sustainability imperatives including climate and disaster-risk resilience; economic and social prosperity; water security; and health and food security in a cost-effective manner. In several vulnerable communities especially in the global south, harnessing nature is considered a cost-friendly approach for reinforcing climate resilience whilst promoting shared social and economic prosperity. This cross-disciplinary session will explore the vital role of NbS in building resilience to disasters and climate change impacts with practitioners from disaster risk, social sciences, natural resource managers, climate scientists, agriculture amongst others.

Merged Sessions: FIN_12.1 & FIN_12.3

Biodiversity Finance for a Nature Positive Future: Innovations, Challenges, and Opportunities

Franziska Schrodt, University of Nottingham, School of Geography, University Park, NG7 2RD, Nottingham, UK, lgzfs@nottingham.ac.uk

In an era of uncertainty and data gaps, we require innovative solutions to conserve and restore biodiversity while promoting sustainable development. This session aims to explore the concept of a Nature Positive Future and the role of biodiversity finance in achieving this vision. Biodiversity finance encompasses a range of financial instruments, funding mechanisms, and innovative approaches to mobilize resources for biodiversity conservation, restoration, and sustainable development.

We will highlight emerging trends and innovative financing approaches, such as green bonds, biodiversity impact bonds, biodiversity credits, and nature-based solutions finance, and invite discussions of their potential to attract investments and scale up conservation efforts. We will further explore the role of the private sector and financial institutions in biodiversity finance and discuss the opportunities and challenges for businesses to integrate biodiversity considerations into their operations. A particular focus will be on exploring traps involved in 'nature positive options' and the importance for the financial sector to avoid these traps to gain, and keep, social legitimacy.

This session will highlight the importance of integrating finance with policy, research, and on-the-ground actions to effectively address the biodiversity crisis, emphasizing the importance of collaboration among interested parties. We will bring together experts from various disciplines to present cutting-edge research and case studies, discuss policy implications, and engage in thought-provoking discussions on how to create a sustainable and equitable world through nature-based solutions and biodiversity financing mechanisms. The session will provide a platform to bridge the gap between science, policy, and practice, fostering collaboration and knowledge exchange for tangible and transformative actions.

The session will feature a combination of keynote presentations, case study presentations, and panel discussions. Key experts from academia, conservation organizations, government agencies, financial institutions, and the private sector are invited to share their experiences, insights, and key challenges.

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Sustainable Finance and Biodiversity

Maria Santos, Department of Geography, University of Zurich, Winterthurerstrasse 190, 8057 Zurich, Switzerland. Email. maria.j.santos@geo.uzh.ch

Biodiversity loss and actions to halt or reverse this trend require substantial investments, calling for adequate responses from the financial sector. Such responses may cover a broad spectrum, such as the assessment of the impact of financial activities on biodiversity, the development and experimentation of new financing mechanisms for biodiversity conservation and restoration, but also the analysis of the financial strategies that should benefit or hinder biodiversity protection and climate resilience simultaneously. In this regard, the concept of functional sustainable finance is, in principle, an important answer to biodiversity change that can be studied from individuals to landscapes,

highlighting the intricate connections between the financial system and the functioning of ecological systems.

We encourage contributions that employ diverse methodologies, observations, modeling, or experimental techniques to understand how, whether and to what extent sustainable finance options interact with biodiversity concerns. Approaches can range from case studies, consumer preferences, to large scale (critical) analysis of the financial system impacts, or a combination thereof. We welcome contributions from various fields of research. This session offers indeed the opportunity for diverse, interdisciplinary, and integrative research to be presented.

GEN_3.1

Genomic solutions for biodiversity conservation: translating cutting-edge research into action

Gözde Cilingir, University of Zurich, Swiss Federal Institute for Research WSL, goezde.cilingir@uzh.ch

Genetic diversity holds profound significance in species conservation, serving as a fundamental component for avoiding extinction and supporting recovery from perilous near-extinction events. Genetic technologies advance at an unprecedented pace. Today, many studies are at the scale of entire genomes rather than a few gene locations, and it becomes increasingly challenging to effectively translate research outcomes into actionable solutions for real-world conservation problems. In light of this difficulty, this open session aims to bridge the gap between research and application by harnessing cutting-edge genomic approaches. We cordially invite scientists from around the globe who have significantly contributed to hands-on conservation actions, leveraging state-of-the-art techniques such as whole-genome sequencing, epigenomics, long-read sequencing, on-site genomic sequencing, and conservation management planning with simulations. By showcasing successful case studies that translate genomic insights into conservation actions, including support of adaptation to climate change, we aspire to explore innovative strategies that ensure the perpetual preservation of our planet's invaluable biodiversity.

GEN_3.2

Protecting and monitoring genetic diversity (by invitation only)

Gernot Segelbacher, University Freiburg, Tennenbacher Str. 4, 79106 Freiburg, gernot.segelbacher@wildlife.uni-freiburg.de

Genetic diversity is of the foundational level biodiversity, key for species fitness, adaptive potential, and the resilience of ecosystems. Historically, genetic diversity was often excluded from biodiversity assessments and/or reports in national and international biodiversity policy frameworks. However, this is rapidly changing because in the CBD post-2020 Global Biodiversity Framework, genetic diversity protection and monitoring is specifically mentioned in Goal A and Target 4, giving a clear mandate for genetic diversity conservation at scales previously reserved for only higher levels of biodiversity. Assessing, monitoring and reporting genetic diversity levels is now key, but for a field that typically works at the single species scale, how to meet this sudden demand requires rapid methodological development.

In this session we will highlight on how contemporary conservation genomic research is enabling us to address key questions through technological advancement, demonstrate how genetic diversity can be monitored at a large scale through reuse of public or multispecies data, and illustrate case studies on how genetic diversity can be reported in policy frameworks. Overall, we aim to provide an overview on recent knowledge and policy advances in the field and outline how these can be leveraged to reduce loss and facilitate restoration across all biodiversity levels.

GEN_3.3

Quantifying plant genetic diversity with spectroscopy

Sofia J. van Moorsel, University of Zurich, Department of Geography, Winterthurerstrasse 190, CH-8057 Zürich, sofia.vanmoorsel@geo.uzh.ch

Optical remote sensing has become an important tool to characterize genetic and species diversity in plant communities. Traits such as plant biochemical composition, anatomy, morphology, and canopy structure, which determine how plants interact with electromagnetic radiation, vary both across and within plant species. These differences can be teased apart effectively by high-resolution (hyperspectral) spectroscopy. Spectroscopy, often in combination with three-dimensional vegetation scanning, e.g. by LiDAR, thus holds great promise for uncovering plant genetic diversity. This is critical not only to track the mostly hidden erosion of genetic diversity, but also for understanding the adaptive potential of plant populations in the face of global change.

In this session, we will bring together a community of researchers who have demonstrated exciting applications in their study organisms, ranging from temperate trees and grasses, to endemic tropical plant species and arctic shrubs. We aim to synthesize and harmonize best practices and exchange challenging experiences to improve future approaches. Our session will furthermore demonstrate the potential of spectroscopy to detect and map genetic diversity within and between species and across temporal and spatial scales.

GOV_13.1

Biodiversity in environmental law – From international frameworks and national legislation to the enforcement of biodiversity through environmental litigation

Gregor Lichtenthäler, IEU UZH, gregor.lichtenthaeler@uzh.ch

This session addresses the regulatory frameworks of biodiversity policies at the international and national level, it presents academic perspectives on biodiversity in environmental law and discusses current enforcement mechanisms in biodiversity related environmental litigation.

We therefore encourage proposals that will cover the monitoring, the support mechanisms and strategies, the responsibility and transparency, the communication, education, awareness uptake or related decisions adopted by the GBF of the CBD. Within the framework of EU Green Deal Biodiversity Strategy for 2030, we encourage contributions related to the enlargement of the Natura 2000 areas, the EU Nature Restoration Plan and its sub-targets or related strategies within the EU Green Deal e.g., the farm to fork or the forest strategy.

Furthermore, we also invite to contribute on the national perspective of the global south as well as EU and Non-EU countries to discuss local achievements as well as challenges of implementing national and international biodiversity action plans.

From the academic perspective on biodiversity-related environmental law, we encourage e.g., contributions to the topic of the human right to a clean, healthy, and sustainable environment, the concept of rights of nature and indigenous approaches to biodiversity governance as well as the role of biodiversity in the framework of the SDGs.

Finally, we invite contributions in the field of biodiversity related environmental litigation. Contributions could cover e.g., links between climate litigation and biodiversity litigation, land-mark decisions as well as strategic argumentation lines in any legal dispute at national, regional, or international level.

The session will be introduced by an opening remark or keynote, followed by individual contributions on the above-mentioned topics. At the end of the session, a moderated panel discussion with all experts will take up overlapping topics or go into more detail on specific aspects and gives the audience the opportunity to comment or clarify questions.

GOV_13.2

Biodiversity values and governance

Daniel Kübler, Department of Political Science, University of Zurich, Affolternstrasse 56, 8050 Zürich, Switzerland; Email: Daniel.Kuebler@ipz.uzh.ch

In this session, we aim at discussing the importance of understanding perspectives on biodiversity values to provide a legitimate and realistic biodiversity governance. The session organizers are involved in an interdisciplinary research project (www.valpar.ch), mandated by the Swiss Federal Office for the Environment (FOEN), that seeks at analysing how a functioning Ecological Infrastructure (EI) needs to be designed and maintained to provide the desired ecological, social and economic services in the future. We will present findings from a literature review on instruments of biodiversity policies worldwide, from perceived biodiversity values of the Swiss population, as well as public preferences for biodiversity governance in Switzerland

This session is open to additional presentations by political scientists, economists and researchers from other disciplines working on themes related to biodiversity policy inside or outside Switzerland.

Confirmed speakers:

- 1) Bokusheva, Raushan & Novo Nunez, Paula, Institute of Natural Resource Science, Zurich University of Applied Sciences: Biodiversity Values of the Swiss Public.
- 2) d'Agostino, Alix & Kübler, Daniel, Department of Political Science, University of Zurich, Switzerland: Public Preferences for Biodiversity Governance in Switzerland.
- 3) Zabel von Felten, Astrid, Center for Development and Environment, University of Bern, Switzerland: Instruments of biodiversity policy: a literature review.

GOV_13.3

Closing the social-ecological loop: from principles to practice

Ute Jacob, Helmholtz Institute for Functional Marine Biodiversity at the University of Oldenburg (HIFMB), Ammerländer Heerstraße 231, 26129 Oldenburg, Germany, ute.jacob@hifmb.de

The social-ecological systems approach has gained traction in recent years, and there is a wealth of research currently underway to bring the different dimensions of social-ecological systems together into a more holistic means of assessing biodiversity changes and their impacts, and responding to these. Changes in biodiversity impacts natural ecosystem functioning, with serious implications for the provisioning of ecosystem services/natures' contributions to people. Societal drivers of, and responses to biodiversity change are not separable from ecological considerations – rather, the two are intertwined. With appreciation of these principles, there are strong moves afoot to action biodiversity targets, with all good intention. However, closing the loop with practical, meaningful and actionable management requires careful thought to be given to our current decision support systems, so that the science-policy-management flows and interlinkages can work more smoothly and harmoniously to achieve global and local biodiversity targets. We invite policy-makers, managers and scientists to give their perspectives as to how these flows can be better aligned and smoothed, and we especially invite case study examples that could inspire others to try the same in their social-ecological systems.

Confirmed speakers

- Juliette Young (INRAE)
- Ute Jacob (HIFMB & Eklipse)
- Ross Thompson (University of Canberra)
- Lynne Shannon (University of Cape Town)

GOV_13.4

Converting biodiversity knowledge into actionable knowledge: A glimpse into the new Biodiversity Knowledge governance in Europe (by invitation only)

Marie Vandewalle (UFZ, BioAgora, Eklipse), Helmholtz Centre for Environmental Research - UFZ, Permoserstraße 15, 04318 Leipzig / Germany, Marie.Vandewalle@ufz.de

A wealth of knowledge and scientific evidence already exists to address the biodiversity crisis and the gaps to better implement (EU) policies. However, accessing and converting this wealth into actionable knowledge remains a challenge, impacting in turn on the whole policy cycle.

To tackle these challenges in Europe, the European Commission (EC) and EU Member States have, over the past decade and through a variety of mechanisms and research programs, endeavoured to position key actors and processes at the science-policy interfaces to strengthen science-based policy support. The urgency of our environmental crises, and the complexity of the transformative pathways required to revert biodiversity loss, need new supporting instruments. This session will be discussing the latest landscape of the knowledge governance in Europe and present a few key instruments, such as the Knowledge Centre for Biodiversity (EC-KCBD) and the Science Service for Biodiversity of the EC as well as new partnerships, i.e., Biodiversa+ and Eklipse.

In addition, the session will explore how BioAgora, the EU project developing the new Science Service for Biodiversity, plans to interact with all those actors in order to ratchet up the implementation of the EU Biodiversity commitments.

With this session, we would like to highlight the current unique opportunity which this fast-evolving science policy interface is offering in Europe to both scientists/ knowledge holders and policy makers to make a difference for biodiversity, and what lessons we can learn from this approach more broadly.

Confirmed speakers

- Nils Bunnefeld (University of Stirling, Eklipse)
- Ute Jacob (HIFMB, Eklipse)
- Kaisa Korhonen-Kurki (SYKE, BioAgora)
- Sybille van den Hove (Bridging for Sustainability SPRL (B4SD))
- Marie Vandewalle (UFZ, Eklipse, BioAgora)
- Juliette Young (INRAE, BioAgora)

HWBSDG_6.1

Biodiversity and the Leave No One Behind: Harnessing Opportunities for Inclusive development

Felix Kwabena Donkor, University of Education-Winneba, felixdonkor2002@yahoo.co.uk

One of the core themes in the 2030 Agenda for sustainable development is the need to ensure that those on the margins of society also benefit from the sustainable development. Biodiversity and healthy ecosystems underpin the 2030 Agenda for Sustainable Development imperative of 'leave no one behind'. This is more so as biodiversity and related ecosystem services form a significant component (circa 50%-90%) of the livelihoods needs, of the world's rural poor and forest communities. Moreover, the loss of biodiversity further aggravates the livelihood and wellbeing of the most vulnerable in society. This situation worsens social inequalities and marginalization (SDG 10) due to diminished access to fundamental resources for sustenance and human wellbeing; thereby restricting their freedom of choice and action. Nevertheless, the alarming rate of biodiversity loss is highlighted by several studies including the recent Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES) regional assessments reports. In addition, biodiversity loss is considered is one of the core global risks, which calls for urgent action as the final decade of action to attain the SDGs gains traction. This session explores the linkages between biodiversity and the leave no one behind agenda; looking at how biodiversity conservation can serve as an instrument for inclusive development.

HWBSDG_6.3

Biodiversity loss and inequality: an interconnected crisis

Vitalii Zemlianskii, University of Zurich, Riedenhaldenstrasse 45, 8046 Zurich, vitalii.zemlianskii@ieu.uzh.ch

We live in conditions of polycrisis characterized by climate change, biodiversity loss, peaking inequality, the refugee crisis, and accelerating tensions between major countries. There is a growing understanding that the different aspects of the crisis cannot be tackled separately but should be addressed together holistically. While the links between climate change and inequality, as well as climate change and biodiversity loss are relatively well studied, the relationship between biodiversity loss and inequalities receives less attention.

Several key aspects of the multidimensional relationship should be highlighted. First, different income groups contribute to biodiversity loss in varying degrees. Similar to climate change, the lifestyles of the rich contribute disproportionately to biodiversity loss through extensive resource use, but also through setting consumption standards for lower income groups, compelling them to work and consume more, further exacerbating the biodiversity loss. Additionally, different inequalities (e.g., economic, race or gender) also affect biodiversity indirectly through (lack of) trust or institutional effectiveness in unequal societies, which in turn affects the effectiveness of biodiversity protection measures. Another important aspect is the highly unequal distribution of access to biodiversity across different groups. Poor and marginalized groups tend to have lower access to biodiversity, while wealthy and privileged areas maintain relatively high biodiversity through outsourcing of environmental damage.

The interconnectedness between inequality and biodiversity loss implies that policies tackling one of the problems would likely affect another. While biodiversity protection measures such as biodiversity credits could harm rural poor and indigenous people, exacerbating inequalities if wrongly implemented, growth-oriented solutions to poverty and inequality reduction could harm biodiversity. Therefore, in this session, we aim to discuss common strategies, that address the problems together, facilitating inequality reduction and biodiversity protection.

HWBSDG_6.4

Biodiversity, Biomimicry & Bio-inspired Technology: Mutualisms for Innovation & Restoration

Joy Lapsertis, Naval Undersea Warfare Center Division, Newport, 1176 Howell Street, Newport, RI 02841 USA, joy.m.lapsertis.civ@us.navy.mil & joy.lapsertis@pro.biomimicry.net

Some of the most compelling arguments for protecting biodiversity include benefits to economic, environmental, and social challenges. Ecosystem services and Nature-based Solutions that utilize organisms are vital approaches, but what about valuing biodiversity as a source of innovations derived from billions of years of adaptations and evolutionary prototyping? Biomimicry draws inspiration from Nature to find solutions to human challenges by emulating strategies, reconnecting people with the world around them, and incorporating an ethos of value and respect for Nature in the products, processes and systems we design. This approach shifts the human-nature relationship from exploitation to valuing Nature inherently as an abundant source of innovative ideas.

This session explores how biodiversity and biomimicry can enjoy a mutualistic relationship, providing inspiration and technical specifications for bio-inspired solutions, supporting sustainable development and business practices, and creating conditions conducive to restoring natural systems. Speakers will address questions such as: How does biodiversity support innovation, and conversely, how can biomimicry support biodiversity? How can biomimicry increase the value of species diversity and conservation efforts? How can we learn from Nature for problem solving, best practices, technology development, and employ lessons that have positive impacts on the environment? How can protecting biodiversity support business sector growth? What is the role for biological research in advancing biomimicry innovations? How can biologists support biomimicry solutions? Submissions are invited that highlight examples of both technological and social innovations based on scientific studies of diverse model- and non-model-species.

HWBSDG_6.5

Biological invasions: from impacts to solutions - lessons from the IPBES-IAS assessment

Daijun Liu daijun.liu@univie.ac.at, Division of BioInvasions, Global Change & Macroecology, Department of Botany and Biodiversity Research, University of Vienna, Austria

Biological invasions are, together with land/sea use change, direct exploitation, pollution and climate change one of the five major drivers of biodiversity loss, impacting all facets of biodiversity changes of our planet. Invasive alien species have a multitude of documents ecological and societal impacts, including risks to human well-being and good quality of life. In addition, with an estimated annual cost of up to US\$163 billion, invasive alien species significantly harm global economies.

In light of their important role within the biodiversity crisis, the recent IPBES Invasive Alien Species Assessment provides the first comprehensive global overview on status quo, drivers, impacts but also management and policy options related to biological invasions. This session aims to draw on this important new resource, mainly focusing on: 1) the status quo and main drivers; 2) associated multiple ecological, economic and societal impacts; 3) current and future scenarios of biological invasions and 4) management options and policy. By addressing these essential issues, this session will not only improve the understanding of biological invasions on natural ecosystem and societies but also contribute to the develop actions to realize a better and more sustainable in the future. We especially encourage people to submit contributions related to impacts, management and policy aspects surrounding biological invasions.

Confirmed speakers

- Prof. Helen Roy, NERC Centre for Ecology & Hydrology, UK
- Prof. Sven Bacher, University of Fribourg, Switzerland
- Dr. Núria Roura-Pascual, University of Girona, Spain

HWBSDG_6.6

Chemical pollution as a driver of biodiversity decline: data, concepts and policy options

Thomas Backhaus, Institute for Environmental Research, RWTH Aachen University, Worringer Weg 1, 52072 Aachen, Germany, thomas.backhaus@gu.se

Several scientific papers and opinion pieces have recently highlighted that chemical pollution is a critical yet insufficiently studied driver of biodiversity decline. Although it is evident from several case studies and pollution events that toxic chemicals can cause massive declines in biodiversity, our broader understanding is still limited, in particular with respect to large-scale long-term complex pollution. One of the main reasons is that our understanding of the impacts of chemical pollution is still largely stemming from investigations with isolated populations under laboratory conditions, evaluating the impact of single, pure chemicals on easily measurable but crude biological endpoints such as mortality. How this can be translated to biodiversity impacts in the real world is largely unclear.

We will begin the session with 3 keynote presentation that critically assess the scientific state of knowledge and recent policy developments, in particular the global post-2020 biodiversity framework and the recently adopted European Nature Restoration Law. In the second half of the session, a series of talks will present new empirical data and case studies that highlight the impact of chemical pollution on biodiversity decline. Ample time will be set aside for interactions with the audience.

Confirmed speakers

- Thomas Backhaus, Institute for Environmental Research, RWTH Aachen University
- Ksenia Groh, Eawag - Swiss Federal Institute of Aquatic Science and Technology
- Henner Hollert, Goethe University Frankfurt

HWBSDG_6.7

Data4Nature: how development banks can share open data to support the Global Biodiversity Framework

Hilary Goodson, Global Biodiversity Information Facility, hgoodson@gbif.org

Open biodiversity data plays a critical role in implementation of and monitoring progress towards global biodiversity targets, as well as the Sustainable Development Goals. Multilateral development banks (MDBs) can contribute significantly in enabling open access to a large volume of new data on biodiversity through the inclusion of clauses within funder-client contracts that require the sharing of primary biodiversity data through the Global Biodiversity Information Facility (GBIF). Data collected during the environmental impact assessment phase of a project is often not shared and remains inaccessible for reuse for robust science and effective biodiversity monitoring. This is particularly critical given that MDB client activities are often in regions that are data-poor and/or have very high levels of biodiversity. By proData4Nature: how MDBs can share open data to support the Global Biodiversity Framework moting data sharing, development banks have an opportunity to promote disclosure of business activities and fill biodiversity data gaps and thus directly support the achievement of targets 15 and 21 of the Kunming-Montreal Global Biodiversity Framework (GBF) and, indirectly, support increased data flows that will strengthen implementation, monitoring and reporting for a large number of other targets with the GBF. The Data4Nature initiative, acknowledged within CBD COP Decision 15/16 on knowledge management, has been created to support MDBs to successfully implement these new data sharing requirements of clients across their global portfolio of projects.

This session will bring together stakeholders within the Data4Nature initiative to:

- Demonstrate the Data4Nature initiative and the contributions of MDBs in increasing biodiversity data for effective monitoring the of the Kunming-Montreal GBF
- Share existing experiences from MDBs in integrating open data sharing requirements within their activities

This session will be followed by a facilitated open discussion to better understand the opportunities and barriers in taking forward this initiative with a view to building up new commitments.

HWBSDG_6.8

Governance in protected areas and local livelihoods

Weiye, Wang; Renmin University of China; Office 936, Mingde Main Building, No.59 Zhongguancun Street, Haidian District, Beijing, China; wangweiye@ruc.edu.cn

Governance in biodiversity conservation could not only affect the results of conservation, but also affect people who live in or near protected areas. This session focuses on discussions related to governance types, conservation policies, and different results on livelihoods and conservation. Variety of governance arrangements in the biodiversity conservation sector around the world deserve a discussion. With the adoption of the Kunming-Montreal Global Biodiversity Framework, variety of governance arrangements in the biodiversity conservation sector around the world deserve a discussion. Studies on these topics are highly welcome.

HWBSDG_6.10

Mitigating artificial light at night (ALAN) for biodiversity and human well-being: state-of-the-art and future avenues

Janine Bolliger, Land-Use Systems, WSL Swiss Federal Research Institute, Zürcherstrasse 111; CH-8903 Birmensdorf, janine.bolliger@wsl.ch

Artificial Light At Night (ALAN) has been identified as a primary driver of environmental change in the 21st century. ALAN has key consequences for both ecological and human systems. For ecological systems ALAN is a key driver of environmental change, resulting in negative fitness-related effects cascading across hierarchical levels from ecological physiological processes to community composition and ecosystem services. For humans, ALAN has generally a positive connotation as it increases time for social activities and is often associated higher feeling of safety. But ALAN also negatively impacts humans' health and well-being, e.g., by increasing the risk of cancer, cardiovascular diseases and depression.

Rapid advances in lighting technology have led to low-maintenance, targeted, long-lasting, and energy-efficient Light Emitting Diodes (LED) lighting systems with high luminous efficacy and opportunities for targeted on-demand and flexible lighting. The technical properties encompass flexible light emission angles and distribution patterns with optical designs that allow for precise light control, light-level reductions (dimmiability), and different spectral compositions of light (e.g., amber, neutral or warm white, monochromatic). The combination of these properties can be used to test, prioritize and optimize the potential of LEDs to reduce negative environmental and human health impacts of ALAN, while keeping up the feeling of safety, visual comfort and functions for human use. This symposium addresses the following questions:

- 1) What are social and ecological impacts of LED?
- 2) How can knowledge from ecological and social impact assessments be integrated in sustainable lighting systems?
- 3) How can lighting practices be optimized in a socially acceptable and environmentally friendly direction?

HWBSDG_6.11

The Earth Metabolome Initiative

Pierre-Marie Allard, COMMONS Lab, Department of Biology, University of Fribourg, Chemin du Musée, 10 – CH1700 Fribourg, Switzerland, pierre-marie.allard@unifr.ch

Life is a complex, dynamic and yet precise interplay of chemical structures and their reactions, orchestrated across dimensions and scales – from the forming and breaking of chemical bonds to the cycling of carbon and nutrients through ecosystems, and from the diversification of molecules to the diversification of all species on Earth. These processes and their participants – metabolites – govern relationships of living beings to each other and the Earth system. Humans depend on the metabolites of other organisms for nutrition and medicines. Yet we have identified only a minute fraction (~0.02%) of the millions of metabolites estimated to be produced across the Tree of Life. This fundamental aspect of biodiversity is a treasure chest yet to be unlocked, and with every species lost it is sinking out of reach.

By describing the ensemble of metabolites – the metabolome – of every organism, the Earth Metabolome Initiative (EMI) aims to reveal the mechanisms that orchestrate and maintain living systems. This information will be digitized and organized in an open knowledge base and accompanied by a metabolome biobank. An ongoing pilot project, the Digital Botanical Gardens Initiative (DBGI), is now developing open science workflows for digitization of chemodiversity from botanical collections. We expect the EMI to identify new ways to conserve, use and manage chemodiversity sustainably, thus directly contributing to the UN's Sustainable Development Goals.

This open session aims to bring together and align EMI members with researchers, practitioners and societal actors. Presentations will focus on the challenge posed by the EMI: to catalogue, contextualize, interpret, and make open Earth's chemodiversity. In doing so, we will evaluate how the EMI can advance life sciences, benefit society, and protect biodiversity - as well as invite participants to discuss and contribute to the future of the Earth Metabolome Initiative as it evolves.

HWBSDG_6.12

Biodiversity and energy transition at the crossroads

Danilo Borja, University of Calgary, 2500 University Drive NW, Calgary Alberta, Canada, T2N 1N4,
pablo.borja@ucalgary.ca

The global energy transition imperative to meet climate goals poses significant challenges for biodiversity. Energy and biodiversity have long interacted through, for example, the effects of emplacements or oil operations in highly sensitive ecosystems and climate change caused by emissions from burning fossil fuels. Currently, the increasing demand and supply of commodities for energy transition, such as biofuels and critical minerals, create new and significant pressures on biodiversity through deforestation, monocultures, and contamination, compromising ecological services and threatening the livelihoods of vulnerable and segregated populations. As such, the energy transition also creates new scientific, political, and policy challenges for biodiversity.

This session's themes include, but are not limited to, the addressing the following questions, and researchers addressing case studies in the Global South are highly encouraged to apply:

- What are the contradictions, affinities, and partnerships between biodiversity and energy transition?
- What are the research and governance challenges and opportunities for biodiversity conservation in the context of the global energy transition?
- How can energy justice be conceptualized and implemented through a biodiversity lens?
- What are the local, national, and global socio-political dynamics and innovations of biodiversity conservation in the context of the energy transition?
- What are the implications of energy transition vis-à-vis biodiversity for vulnerable and disadvantaged populations (e.g., Indigenous people and peasants)?

MONMOD_10.1

Integrating earth observations and biological tools in ecology and evolution to cogenerate knowledge towards meeting the Kunming-Montreal Global Biodiversity Framework targets

Jeannine Cavender-Bares, University of Minnesota, cavender@umn.edu

New sensors and data products are capable of detecting biodiversity and ecosystem change and the responses of our living planet to global change from space. These are greatly needed to monitor changes in biodiversity and ecosystems globally and to determine progress towards or away from globally agreed upon targets of the Montreal-Kunming Global Biodiversity Framework. The session will emphasize cutting-edge research on the integration of earth observations with a suite of other techniques used for ecological investigation including molecular analyses, global change experiments, and studies of ecosystem function with biospheric consequences. The session will be of broad interest in highlighting emerging technologies and diverse applications of remotely sensed data in understanding ecological processes that span spatial, temporal and biological scales. These approaches can be co-designed with stakeholders, who need products at a range of scales for decision making. Presentations will span terrestrial ecological systems using spectral, fluorescence and lidar observations from leaves, ecosystems and landscapes to integrate among subdisciplines and scales. Bringing together a diverse group of multidisciplinary researchers, the session will illustrate advances in critical questions about biodiversity, ecosystem function, global environmental change and ecosystem management. The session offers a timely opportunity to demonstrate novel ways spectral and remotely sensed information can be used to integrate across biological scales to address monitoring needs for goals and targets of the Global Biodiversity Framework. The session is intended to dovetail with the workshop on Closing biodiversity monitoring gaps with space-based and in situ observations for assessment and evaluation needs of the Kunming-Montreal Global Biodiversity Framework .

MONMOD_10.2

Navigating the social and political dimensions of biodiversity data

Melissa Chapman, National Center for Ecological Analysis and Synthesis (NCEAS), 1021 Anacapa St, Santa Barbara, CA 93101, United States, mchapman@nceas.ucsb.edu

Repositories of biodiversity data are rapidly expanding, offering unparalleled insights into ecological patterns across scales. These data are increasingly recognized as valuable resources to guide the implementation of global environmental policies. However, the use of synthesized biodiversity observations often overlooks that these data often tell us most about the one species they never intended to include—humans. Biodiversity observations capture several social and political patterns, from the expansion of infrastructure to the proliferation of surveillance technology to echoes of existing racial and economic disparities. Effectively leveraging past, present, and future biodiversity data to inform equitable conservation efforts will require not only improving statistical methods but also understanding the social, cultural, and political processes that underpin data infrastructures and drive data disparities.

This session aims to explore multidisciplinary approaches to harnessing biodiversity data for effective and equitable conservation planning. We invite abstracts that contribute to three key areas of inquiry:

1. Understanding the human dimensions of biodiversity data.
2. Developing methodologies to address biases along social dimensions within synthesis biodiversity data.
3. Assessing the implications of data disparities on conservation decision-making.

By exploring these themes, we aim to foster a shared understanding of the multifaceted challenges involved in leveraging synthesis biodiversity data, while promoting a more inclusive and socially aware approach to conservation efforts.

MONMOD_10.3

Recent changes and future challenges in alpine biodiversity

Harald Pauli, Austrian Academy of Sciences, harald.pauli@oeaw.ac.at

Alpine areas of the world's mountains cover less than three percent of the planet's terrestrial surface. Owing to a complex topography, the compression of thermal life zones and low levels of human land use, high mountains host outstandingly high numbers of species. Distribution areas of alpine species, however, are generally far smaller, more scattered or fragmented than those of lowland species. This and their adaptation to low-temperature conditions makes them vulnerable to effects of climate change.

Efforts in long-term monitoring, experimental research and modelling studies are therefore much demanded for determining magnitudes, velocities, functionalities and idiosyncrasies of biodiversity change in alpine environments. Much of the ongoing monitoring and research activity is located in mountain protected areas, which depend on knowledge about biodiversity losses for developing targeted conservation measures.

This session aims for contributions of observed biodiversity changes in alpine vegetation, biotic homogenization, neo biota, but also on animal organism groups and soil biota, results of experimental studies and predictive species distribution modelling. The main focus lies on effects of climate change, such as of the thermal regimes and of water availability, however, does not exclude other anthropogenic impacts, as for instance nitrogen deposition or changes in land use practices, which may interact with those of climate change. Besides research on ecosystem responses to anthropogenic drivers, the session addresses perspectives of conservation biology including the situation of protected area managements in view of ongoing or expected extinction processes.

MONMOD_10.4

Species distribution models for spatial prioritization of biodiversity conservation

Antoine Guisan, Ecospat lab, University of Lausanne, DEE & IDYST, 1015 Lausanne, Switzerland, antoine.guisan@unil.ch

Species distribution models (SDMs) have developed tremendously during the last two decades, and are now essential tools to predict the fate of biodiversity under global changes in national/international assessments. This boom in SDM development has fostered the use of their predictions as inputs into spatial biodiversity prioritization, to help practitioners develop resilient conservation plans. However, different types and parameterizations of SDMs and decisions at the level of predictions and prioritization can lead to vastly different predictions for the same species, and consequently very different prioritization outcomes. More standards for SDMs are thus needed, but also more experience in using SDMs for biodiversity prioritization. Thus, much remains to be done to standardize the use of SDMs for spatial prioritization, in discussion with practitioners, to reach agreement on the different key steps and components to be included in SDMs to efficiently and more systematically support conservation. The aim of this session will be to put together a series of talks by speakers active in various aspects of SDM and spatial conservation planning, and applications in spatial biodiversity conservation, including the design of protected areas and national ecological infrastructures. It will also consider key dimensions of biodiversity changes, such as climate change, biological invasions, and other drivers of species threats. Key speakers from potentially all over the world will be invited to submit an abstract.

MONMOD_10.5

Towards a global assessment of mountain biodiversity

Davnah Urbach, Global Mountain Biodiversity Assessment, University of Bern - Institute of Plant Sciences, Altenbergrain 21, CH-3013 Bern & University of Lausanne - Interdisciplinary Centre for Mountain Research, davnah.urbach@unibe.ch

In recent years, the amount, coverage, and accessibility of biodiversity data and knowledge have been steadily increasing. This is the case also for mountains, where long-term monitoring programs, research projects, citizen science initiatives, as well as BioBlitz and remote sensing campaigns are contributing to an increasingly detailed mapping of species and their distributions. Such developments are particularly timely in view of the United Nation's Sustainable Development Agenda and the new targets agreed upon in the Kunming-Montreal Global Biodiversity Framework, which call for reporting on biodiversity protection also in mountains.

With the increasing availability of mountain biodiversity data worldwide, local, national, regional, and global assessments of biodiversity facets have become possible. Such efforts represent various case studies based on data, literature, or surveys. Together they serve but also call for deriving best practices and for discussing the data requirements and other methodological challenges associated with the assessment and analysis of mountain biodiversity and ecosystems across scales.

This session aims at convening mountain biodiversity scientists involved in or interested in participating in mountain biodiversity and ecosystem assessments to (1) share examples of assessments at various scales and 2) discuss conceptual and methodological challenges and opportunities associated with data, literature or survey- based biodiversity assessments in mountain regions.

MONMOD_10.6

Tropical forest patches: spatio-temporal dynamics, sustainable use and conservation

Vladimir Wingate, Universität Bern, vladimir.wingate@unibe.ch

Tropical forests are essential to the Earth's System, providing countless ecosystem functions and services such as biodiversity conservation and climate regulation. Despite this, ever-increasing rates of deforestation and fragmentation are jeopardizing the continued provisioning of these essential functions and services. The demand for commodities in international markets and the consequent conversion of forests to agricultural land chiefly drive this process. The result is a newly formed and dynamic landscape composed of forest fragments, in many cases embedded in agricultural areas. Most of the research and efforts have been focused on studying tropical forests for their conservation and sustainable use. Little attention and importance have been given to tropical forest fragments, crucial to sustaining local livelihood, biodiversity, and climatic stability, but are much more vulnerable to degradation. Therefore, this session aims to open a space for discussion on new theories and methods related to tropical forest fragments, such as their mapping and monitoring; their spatio-temporal patterns and drivers; their structure, function, biodiversity, and provision of ecosystem services, as well as the evaluation of the impacts that anthropogenic disturbances have on them; and how they can be conserved, restored and used sustainably.

MONMOD_10.7

Unleashing the Power of Blockchain, IoT, and eDNA to Create a Paradigm Shift for Global Biodiversity Monitoring Systems

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Monitoring data for biodiversity at a global scale stays elusive and underfinanced. This symposium aims to provide a platform for interdisciplinary discussions and knowledge exchange to drive forward the integration of new collaboration tools such as blockchain, environmental DNA (eDNA) and Internet of Things (IoT) to power open data for biodiversity monitoring. Blockchain technology offers transparent, immutable, and decentralized data management, fostering trust and security. By enabling the creation of tamper-proof digital records, blockchain can enhance the reliability and integrity of biodiversity data, contributing to robust monitoring systems and accurate assessments of species populations, habitat changes, and ecosystem dynamics. To collect this data on mass, the promise of IoT allows for the interconnection of devices and sensors, generating vast amounts of real-time data and eDNA technology generates accurate data on the state of biodiversity from genetic to community levels. This symposium will delve into the opportunities and challenges of harnessing open data through blockchain integration with data from IoT and eDNA to unlock valuable insights, facilitate evidence-based decision-making, and empower local communities through case studies. We invite researchers, practitioners, and stakeholders from academia, industry, and civil society to submit their original research, case studies, and technological advancements that showcase these technologies in biodiversity monitoring. Join us at this symposium to collectively pave the way for a data-driven, technology-enabled future that safeguards our planet's rich biodiversity.

MONMOD_10.8

Learning from existing national approaches to monitoring changes in forest biodiversity worldwide to increase their effectiveness

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Biodiversity is declining worldwide at an unprecedented rate. This applies not only to ecosystems that have been largely altered by humans, but also to more natural systems such as forests. Each country has its own and often unique forest biodiversity, which depends, for example, on e.g., geographic location, climate, type of use, and land-use history. The conservation and sustainable use of forest biodiversity is essential at the national level because it contributes to the country's natural capital and support the provision of forest services. Sparked by the recognition of global biodiversity loss, many countries have created national strategies, policies, and legal frameworks to promote forest biodiversity conservation. Approaches and implementation vary from country to country due to different constraints, expertise, and objectives. Crucial for all is a functioning and representative monitoring system that can detect changes in biodiversity and evaluate the measures taken. The aim of this session is to bring together people involved in forest biodiversity monitoring worldwide to critically discuss existing monitoring systems and approaches and identify effective ways to establish a national monitoring system for forests.

MONMOD_10.9

Digital Twin applications to foster actions for biodiversity conservation

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Global change, including climate change and land use change, is increasingly confronting society with a number of natural and societal challenges, one of which is the loss of biodiversity and the quality of the natural environment. In order to take timely action to halt or reverse the loss of biodiversity, researchers and policy makers are seeking solutions to better monitor the biodiversity of ecosystems and to reliably predict its development in a changing environment. To date, decisions on biodiversity conservation have mostly been made on the basis of ground-truth and remote monitoring campaigns, often combined with predictive modelling or experimental studies. However, observations are not immediately available (or may never be available) to verify model-based predictions, or may be available too late if immediate action has already been required. As a result, recommendations for action may be out of date, especially if environmental conditions change fast or unexpectedly. To respond to environmental changes in a timely manner, the Digital Twin approach provides the ability to not only observe changes in the ecosystem in near real-time, but also to digitally predict changes that require action. Digital Twin frameworks are characterised by frequent updates and feedbacks between the real world (via monitoring and potential actions) and the predictive modelling approach (via simulations, model adjustments and model/data-based information for decision-making). This session aims to present digital twin approaches of terrestrial, aquatic and marine ecosystems focusing on different aspects or parts of biodiversity within these ecosystems. With a focus on Digital Twin applications that are either already successfully implemented or under development, we aim to foster exchange on challenges and solutions in developing such frameworks and to promote discussion on requirements for end-users (e.g., policy makers) to truly move from science to action.

MONMOD_10.10

Old gaps and new solutions for global biodiversity monitoring and decision-support

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The new CBD Global Biodiversity Framework (GBF) and associated processes are energizing governments and businesses worldwide to deliver more effective measurements and decisions for biodiversity. Traditional biodiversity measurements remain inherently limited in their ecological coverage causing significant gaps and biases in the current evidence base. These knowledge constraints impede robust decisions by stakeholders across scales and cause ineffectual or even negative biodiversity outcomes. The recognition and measurement of biodiversity information gaps, as stipulated by Target 21 of the GBF, is therefore central to support efficient monitoring, identify solutions to close them, and account for remaining uncertainty in downstream actions.

The goal of our session is to explore the needs, gaps, and opportunities around the collection and use of an action-relevant global biodiversity knowledge. This session will first review the data and information needs which effective actions for global biodiversity require. We will then present different approaches to measuring existing knowledge gaps across biodiversity dimensions and explore how they might be able to measure progress toward GBF Target 21 which aims to ensure that best available data, information, and knowledge are accessible to decision-makers, practitioners, and the public. We will use this as basis for identifying avenues for delivering a more effective biodiversity monitoring and more robust information products in support of biodiversity outcomes. These approaches leverage existing or emerging data streams in combination with novel computational and sensor technologies.

Confirmed speakers

- Melodie McGeoch, LaTrobe University, Australia
- Antoine Guisan, Lausanne University, Switzerland
- Tim Hirsch, GBIF, Denmark
- Steven Chown, Monash University, Australia
- Walter Jetz, Yale University, USA
- Jillian Campbell, CBD, Montreal, Canada (TBC, contingent on SBSTTA timing)

PHIETH_9.1

Philosophies of biodiversity conservation

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In this session we welcome contributions that discuss different questions concerning biodiversity conservation from the perspective of philosophy, ethics and political theory. Particularly welcome are papers that address the general theme of the conference, from science to action. Potential other topics include:

- The philosophy of valuing and protecting biodiversity
- Justice and politics in biodiversity conservation, including such issues as ownership of genetic resources, democracy and biodiversity, transparency of biodiversity data, bio/ecosecurity
- Ethical analysis of different conservation techniques and strategies such as de-extinction, natural vs. artificial biodiversity conservation, assisted migration, ecological restoration and rewilding
- Analysis and critique of the biodiversity concept in environmental philosophy and promising alternative concepts

We are open to presentations from different philosophical positions and traditions.

We organise two sessions during the conference, and presentations will be grouped by their content with one session dedicated to more abstract deliberations in terms of conceptual analysis, value-theory, biodiversity as a philosophical problem etc. and a second session being primarily dedicated to application/policy-orientated normative questions. Especially welcome are abstracts that focus on a philosophical analysis of science, ethics, and policy. Each presentation is allocated 30 min (for the presentation and Q&A). The WBF conference attracts an interdisciplinary academic audience that is interested in different aspects of biodiversity conservation. Therefore, we emphasise that presentations should address an interdisciplinary audience. Interested presenters will also have the opportunity to share their presentations in form of draft papers with the other thematic session participants before the conference to allow for further in-depth exchange (optional pre-read papers).

SCEN_22.1

Sustainable development in the forest-dependent communities: forest role, livelihoods, biodiversity, cultural-spiritual values, and life quality

Diaz-Maroto Ignacio J., University of Santiago de Compostela, Campus Terra s/n, E-27002 Lugo, Spain, ignacio.diazmaroto@usc.es

Our goal is to promote a debate, through assessment and analysis, about the key role that forests play in the sustainable development of forest-dependent communities in developing countries. The issue is complex because it involves social, economic, political and environmental aspects, being essential an adequate coordination between all the administrations and/or organizations concerned. Also, between all stakeholders implicated. For one hand, the human population is growing at an excessive rate, so that it will require livelihoods maybe two or three times higher than it does today. A livelihood not only includes people, but also their abilities, incomes, foods, and other resources. It is sustainable when at least maintains the resources of which depends on and at the same time can also provide them for the future generations. For another hand, the multifunctional nature of forests –multiple use– promotes the creation of markets for forest products other than wood, which could generate enough capital to finance forest management linked to rural development. Policymakers, private forest ownership and the individual’s capacity to identify the opportunities are essential factors in the making of growth possibilities for rural communities. Feedback from all experts suggest a need for training programs, aiming to present opportunities offered by the forestry sector for rural development. Most recent assessments of forest ecosystems prioritize the economic values including freshwater, carbon storage, production of foods and building materials, medicines, gas exchange, productivity from sunlight, soil conservation, shade, and biodiversity habitat. However, many ecosystem services assessments ignore the spiritual value of forests, which is harder to measure with economic metrics. The spiritual and cultural value of forests is not only critical in scope but also imply to have a greatest potential for significant international conservation actions, given that several billion people value their forests predominantly because of their spiritual significance.

SCICOM_15.1

Opening up and preparing scientific publications for the chatGPT-age (by invitation only)

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Our scientific understanding of biodiversity is traditionally communicated through scientific publications and reports in a format geared towards the human reader. The sheer number of publications produced annually, and a backlog of hundreds of millions of pages make it impossible to keep up with this knowledge, even for a restricted topic. Also, the discovery of new relevant publications is challenging, albeit in a digital world this could be instantaneous. This has an impact from reviewing the state and changes in biodiversity and its causes to measuring and understanding the impact of recommendations. It contributes to a North-South divide of access to this information, and it is not suited to make use of fledgling artificial intelligence applications to mine and discover the wealth embedded in this data.

Recent developments in converting scientific publications or publishing them from the beginning in machine-actionable, semantic blocks of text are leading a way forward for example to access data about species or discover biotic interactions. Furthermore, since these blocks of text or data are made findable, accessible, interoperable and reusable (FAIR data) through the Biodiversity Literature Repository (BLR) and the biodiversityPMC, this opens scientific publications to everybody, as well as to advanced data analytic and artificial tools. It also enables customizing the annotations in publications for domain specific purposes, for example to support reporting in IPBES.

In this session an overview will be provided of how to access biodiversity data through the biodiversityPMC and BLR, how publications can be processed after publishing or published in machine actionable ways to import into biodiversityPMC and BLR, and how the data is being used. Part of the session will include representative invited lectures the other part will be used for a discussion with potential stakeholders.

- Laurence Bénichou, Muséum national d'Histoire naturelle, Paris, France
- Rainer Krug, Department of Evolutionary Biology and Environmental Studies. University of Zürich, Zurich, Switzerland
- Patrick Ruck, Swiss Institute of Bioinformatics, Carouge, Switzerland
- Fabio Rinaldi, Dalle Molle Institute for Artificial Intelligence (IDSIA), Viganello, Switzerland
- Rob Waterhouse, SIB Swiss Institute of Bioinformatics, Lausanne, Switzerland

SOIL_2.1

Bridging scales in soil biodiversity–ecosystem functioning relationships

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Ten years after the seminal paper by Bardgett and van der Putten (2014, Nature) on the functional role of soil biodiversity in ecosystems, many small- to large-scale studies have been performed and delivered novel insights into the significance of soil biodiversity for the functioning of ecosystems. This session welcomes contributions from a diversity of approaches studying soil biodiversity–ecosystem functioning relationships ranging from highly-controlled microcosm experiments to global observational studies of macroecological patterns. We will present cutting-edge methods and recent developments in the field, to discuss the (1) main achievements in the last 10 years and (2) important research frontiers in soil biodiversity–ecosystem functioning research. The overarching goal will be to synthesize information based on different approaches to bridge small-scale interactions among plants, microbes, and animals to global carbon and element cycles. All contributions to the session will be invited to submit a manuscript to a Special Issue in the APC-free open-access journal Soil Organisms, and all contributors to discussions and writing will be invited to co-author a perspectives paper based on the mini-workshop associated to the session.

TD_21.1

Practicing critical social theory to achieve paradigm-shifting just transformations

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While ‘transformative change’ has been interpreted in many different ways, most experts now agree that any paradigm-shifting transformation must necessarily be transdisciplinary (Visseren-Hamakers and Kok 2022) and just (Fougères et al 2022). At the same time, many transdisciplinary transformative change initiatives (TTCIs) lack a deeper analysis of power and continue to operate under the assumption that technocratic scientific approaches are apolitical (Büscher et al. 2022, Turnhout & Lahsen 2022). As a result, certain voices and perspectives are often muted or completely absent in TTCIs (Bennet et al. 2019, Chambers et al. 2022). To address this conundrum, many scholars now increasingly highlight the potential role of critical social sciences (CSS) in TTCIs (Deutsch et al. 2023, Massarella et al, 2021, Scoones et al. 2020)

Part of the lack of serious engagement with CSS in TTCIs can be explained by the tendency to conceptualize social sciences as a single homogenous group. Attempts to incorporate social sciences in TTCIs thus tend to favour those that support traditional (i.e. non-paradigm-shifting) conservation goals, such as those that focus on changing individual behaviours without addressing the structural barriers to this (Ejderyan et al., 2019; Turnhout and Lahsen, 2022). CSS are those which approach socio-ecological issues from critical theoretical perspectives (e.g. see Shackleton et al., 2022). They focus on structural knowledge/power and agency dynamics and their causal links to socio-ecological problems. They encourage us to ask questions about what a “fundamental, system-wide reorganization” looks like in theory and practice and invite us to interrogate whose paradigms, goals, and values must be reorganized and how (Massarella et al. 2021). However, CSS often focus more on critiquing dominant power relations than on offering concrete pathways for action to transform them.

In this session, we aim to explore the practical application of critical social sciences in transdisciplinary transformative change initiatives.

TD_21.2

Conservation science, policy and diplomacy: Notes from the trenches of transdisciplinary research

Clara Zemp, Laboratory of Conservation Biology, University of Neuchâtel, Rue Emile-Argand 11, 2000 Neuchâtel, Switzerland, clara.zemp@unine.ch

Tackling biodiversity loss in an interconnected and changing world is a great societal challenge. It requires transdisciplinary solutions at the interface between conservation science, policy and international cooperation. This session provides a platform for sharing experiences related to transdisciplinary research that includes people or groups outside of academia as part of the research process. We welcome contributions related to the process of engagement or collaboration with policy-makers; to evidence-based decision making; to the role of science in international relations and to the communication of scientific knowledge to decision makers at various spatial scales. This session focuses on sharing lessons and challenges in transdisciplinary research that are most often not included in scientific papers.

UN_20.1

Integrating mountains in the Kunming-Montreal Global Biodiversity Framework: monitoring, research, and engagement in regional and global policy processes

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At the 2022 UN Biodiversity Conference (COP15), the UN Secretary-General stated that Parties had the “urgent task of making peace with nature”, given how the world is losing its biodiversity at an alarming rate and with it the planet’s life-support systems. Mountains also shared a spotlight at COP15, with a high-level side event hosted by the UN Environment Programme and partners to not only highlight this plight for mountains but also raise these issues as part of the observance of the International Year for Sustainable Mountain Development in 2022. The event highlighted efforts that prioritize mountain biodiversity and the need for its protection within the Post-2020 outcome and its implementation while giving insights on supporting science-policy processes and inputs that help substantiate those deliberations. COP15 concluded with the adoption of the Kunming-Montreal Global Biodiversity Framework (GBF), which stipulates four overarching goals and a set of targets to be achieved by 2030. Implementing this framework also means mobilising resources and technical and scientific cooperation to close financial and capacity gaps between developed and developing countries. So, what does this outcome mean for mountains and science-policy exchanges needed to support the implementation of the Kunming-Montreal GBF? Drawing from various cases at multiple scales, this session showcases actions that focus on enhancing research, monitoring, and engagement to help include mountains in science-policy processes, and critically discuss how these contribute to implementing key priorities set within the Kunming-Montreal GBF. Examples include the Convention on Biological Diversity Program of Work on Mountain Biodiversity and the National Biodiversity Strategies and Action Plans, as well as research providing policy-relevant knowledge on biodiversity-related opportunities for adaptive management of mountain ecosystems and sustainable development. This session also invites additional contributions based on inter- and transdisciplinary research, either in mountains or other contexts that offer transferable insights relevant for mountains.

URB_16.1

Enhancing Urban Biodiversity through Blue-Green Infrastructure: A Multidisciplinary Approach

Lauren Cook, Swiss Federal Institute of Aquatic Science and Technology (Eawag), Urban Water Management, Ueberlandstrasse 133, 8600 Dübendorf, Lauren.cook@eawag.ch

This session aims to explore the role of blue-green infrastructure in urban areas and the multidisciplinary collaboration required for its successful implementation. We invite contributions that examine the conceptual foundations, practical applications, and case studies related to urban biodiversity conservation through integrated blue-green infrastructure.

Contributions may include:

- Ecological and social research on the benefits and challenges in promoting urban biodiversity with blue-green infrastructure.
- Innovative urban planning strategies and policies for integrating blue-green infrastructure to enhance biodiversity and urban resilience.
- Design principles and engineering techniques for creating multifunctional blue-green spaces that provide habitat and mitigate environmental challenges.
- Evaluation of the effectiveness of blue-green infrastructure in improving urban biodiversity and enhancing ecosystem services.
- Case studies showcasing successful examples of blue-green infrastructure implementation in different urban contexts.
- Socio-economic considerations and stakeholder engagement in the planning and management of blue-green infrastructure projects.

This session aims to foster a holistic understanding of urban biodiversity conservation and the integration of nature in urban landscapes. By bringing together researchers, practitioners, and policymakers from multiple disciplines, we seek to advance knowledge and inform practices for creating sustainable and resilient cities.

VAL_7.1

Tapping into alternative knowledge systems to transform biodiversity and conservation management

Lynne Shannon, University of Cape Town, Private Bag X3, Rondebosch, 7701, South Africa;
lynne.shannon@uct.ac.za

This novel and alternative session aims to provide an informative and convivial forum for learning and discussion around the role of alternative knowledge systems in biodiversity-related fields. In recent decades there has been slow but steady progress in incorporating intuitive interspecies communication into efforts to solve biodiversity and conservation problems. There is new and exciting scholarly discourse around research and practice in this regard. In turn, practitioners have demonstrated notable successes of drawing upon intuitive interspecies communication to enhance our understanding of the natural world, thereby generating new knowledge that has improved conservation and resource management. We invite contributions that draw on scholarly sources, thought leadership, established initiatives and practical examples of the role of intuitive interspecies communication in bridging nature-human tensions and in providing alternative insights and knowledge for transforming biodiversity and conservation management.

Confirmed Speaker

Wynter Wortshorne, AnimalTalkAfrica, South Africa